

-- 1 OF 8

--AN(1) - AGENCY ACCESSION NUMBER: DF407272

--ANA(1A) - ACTIVITY CODE: FES

--TT(2) - TRANSACTION TYPE: M

--SE(3) - STATUS OF EFFORT: CHANGED

--PM(4) - PERFORMANCE METHOD: CONTRACT

--SI(5) - PERFORMANCE TYPE: ROTE

--RD(6) - DATE OF SUMMARY: 16 SEP 94

--PRD(7) - DATE OF PRECEDING SUMMARY: 14 MAY 93

--SDT(8) - START DATE OF EFFORT: 0 MAR 90

--EDT(9) - END DATE: 0 SEP 93

--ECC(10) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED

--RCC(12) - RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED

--DC(18) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED

--DR(19) - DISTRIBUTION REASON: PB

--TI(20) - TITLE (UNCLASSIFIED): NOX FORMATION AND CONTROL IN A GAS

-- TURBINE COMBUSTOR

--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 55

--FG(25) - DOD SUBJECT CATEGORIES:

-- 2105 JET AND GAS TURBINE ENGINES

-- 2104 FUELS

--RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 426402

--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMSTRONG LAB TYNDALL AFB FL

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--RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: SAME

--RLC(27.3A) - RESPONSIBLE ORGANIZATION CITY: TYNDALL AFB

--RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: FL

--RLZ(27.3C) - RESPONSIBLE ORGANIZATION ZIP CODE: 32403-5028

--RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 1201

--RIN(27.4) - RESP. INDIV: WANDER, JOE

--RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AL/EQS

--RIP(27.6) - RESP. ORG. PHONE NUMBER: 904-283-6240

--RIA(27.7) - RESP. INDIV. DSN NUMBER: 523-6240

--SC(28) - PERFORMING ORG. SOURCE CODE: 387300

--POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE

--POC(28.2) - PERF. ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA

--PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE

--SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA

--GC(28.3D) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640

--OT(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0

--AU(28.4) - PRIN. INVESTIGATOR: SAMUELSON, G.S.

--PIO(28.5) - PRIN. INVEST. OFFICE SYMBOL: N/A

--PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-856-5468

--P2N(28.8) - ASSOCIATE INVESTIGATORS:

--P2N1(28.8A) - 1ST ASSOC. INVESTIGATOR: SOWA, BILL DR

--PEP(30) - PRIM PE NBR: 0602601F

--PJP(30A) - PRIM PROJ NBR: 1900

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--TNP(30B) - PRIM TASK NBR: 70 55

--FFY(30C1) - PRIM FY1: 90

--FDA(30C2) - PRIM AMOUNT 1: 00275

--FDW(30C3) - PRIM WORK YRS 1: 00.1

--FFY(30D1) - PRIM FY2: 91

--FDA(30D2) - PRIM AMOUNT 2: 00165

--FDW(30D3) - PRIM WORK YRS 2: 00.1

--FFY(30E1) - PRIM FY3: 92

--FDA(30E2) - PRIM AMOUNT 3: 00143

--FDW(30E3) - PRIM WORK YRS 3: 00.1

--FFY(30F1) - PRIM FY4: 93

--FDA(30F2) - PRIM AMOUNT 4: 00135

--FDW(30F3) - PRIM WORK YRS 4: 00.1

--CT(34) - CONTRACT/GRANT TRANSFER NUMBER: F086359000100
--CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 28 MAR 90
--CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 30 SEP 94
--CFV(34.3) - CONTRACT/GRANT FACE VALUE: \$ 843,220
--TOT(34.4) - CONTRACT/GRANT CUM TOTAL: \$ 728,220
--KW(35) - KEYWORDS: NOX ; COMBUSTOR ; GAS TURBINE ENGINE ;
-- LASER DIAGNOSTICS ; MIXING ; THERMAL DENOX ;
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--OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
--OBJ(36.1) - OBJECTIVE: (U) ESTABLISH THE FUNCTIONAL DEPENDENCE OF THE
-- FORMATION OF NITRIC OXIDE AND NITROGEN DIOXIDE DURING GAS TURBINE
-- COMBUSTION ON THE PROCESSES ASSOCIATED WITH FUEL INJECTION, FUEL-AIR
-- MIXING, AND WALL-JET INJECTION OF AIR. EXAMINE THE DEPENDENCE OF
-- SELECTIVE NONCATALYTIC REDUCTION OF NOX BY AMMONIA ON PROCESSES
-- ASSOCIATED WITH MIXING OF AMMONIA INTO THE HOT EXHAUST GAS.
--APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
--APP(37.1) - APPROACH: (U) NONINTRUSIVE LASER DIAGNOSTICS WILL BE APPLIED
-- FOR SPATIALLY-RESOLVED MEASUREMENTS OF KEY PROPERTIES IN THE TWO-PHASE
-- FLOW, INCLUDING DROPLET-SIZE STATISTICS, DROPLET VELOCITY STATISTICS,
-- RADIATIVE FLUX, GAS VELOCITY STATISTICS, GAS TEMPERATURE STATISTICS, AND
-- GAS CONCENTRATION STATISTICS.
--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
--PRG(38.1) - PROGRESS: (U) DIRECT SPECTROSCOPIC MEASUREMENTS OF
-- INTERMEDIATES AND PRODUCTS AS A FUNCTION OF TIME AND LOCATION IN THE
-- FLAME ZONE OF A SERIES OF WALL-JET COMBUSTORS CONFIGURED TO
-- SYSTEMATICALLY VARY AIRFLOW PATTERNS (AND MIXING PROCESSES) REVEALED
-- EXTREME DEPENDENCE BOTH OF CONCENTRATIONS OF POLLUTANTS AND IN TEMPORAL
-- AND SPATIAL VARIABILITY OF CONCENTRATIONS MEASURED. CHARACTERIZATION WAS
-- EXTENDED WITH MEASUREMENTS OF ENGINES RUNNING IN A TEST CELL AT
-- MCCLELLAN AFB CA, AND RESULTS WILL BE GENERALIZED AS A COMPUTATIONAL
-- MODEL. DATA INDICATE THAT SNCR IS UNFEASIBLE AT IDLE AND AFTERBURNER
--
-- DOWN SETTINGS.
--PDN(39) - PRODUCTS:
--PI(39.5) - PRODUCT INDICATOR: Y
--DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: HI
--PD(46) - PROCESSING DATE: 26 OCT 94
--RCD(47) - RECEIPT DATE: 27 JUL 93
--DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
--DE(48.1) - DESCRIPTORS: (U) AIR FLOW ; AMMONIA ; COMBUSTION ;
-- COMBUSTORS ; COMPUTATIONS ; CONCENTRATION(COMPOSITION) ;
-- DIAGNOSIS(GENERAL) ; DROPS ; EXHAUST GASES ; FLAMES ;
-- FLUX(RATE) ; FUEL AIR RATIO ; FUEL INJECTION ; GAS TURBINES ;
-- GASES ; HOT GASES ; LASER APPLICATIONS ; MATHEMATICAL MODELS ;
-- MIXING ; NITROGEN DIOXIDE ; NITROGEN OXIDES ; PATTERNS ;
-- POLLUTANTS ; RADIATION ; STATISTICS ; TEMPERATURE ; TEST
-- EQUIPMENT ; TWO PHASE FLOW ; VELOCITY ;
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-- 2 OF 8
--AN(1) - AGENCY ACCESSION NUMBER: DA360284
--ANA(1A) - ACTIVITY CODE: MDRD
--TT(2) - TRANSACTION TYPE: M
--SE(3) - STATUS OF EFFORT: CHANGED
--PM(4) - PERFORMANCE METHOD: GRANT
--SI(5) - PERFORMANCE TYPE: ROTE
--
--RD(6) - DATE OF SUMMARY: 26 SEP 95
--PRD(7) - DATE OF PRECEDING SUMMARY: 28 AUG 95
--SDT(8) - START DATE OF EFFORT: 0 SEP 94
--EDT(9) - END DATE: 0 AUG 98
--FOC(10) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED

--DR(19) - DISTRIBUTION REASON: PB
--TI(20) - TITLE (UNCLASSIFIED): STRUCTURE/FUNCTION OF RECOMBINANT HUMAN
-- ESTROGEN RECEPTOR
--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 421
--SCH(24) - SEARCH DATA: FHJ09M,FHJ58K,931001
--FG(25) - DOD SUBJECT CATEGORIES:
-- 0605 MEDICINE AND MEDICAL RESEARCH
--TAC(26) - TAXONOMY CODES:
--MC(26.1) - MISSION AREA CODE:
--MC1(26.11) - FIRST MISSION AREA CODE: 5.3
--FC(26.2) - FUNCTION CODE:
--FC1(26.21) - FIRST FUNCTION CODE: 10.1
--TE(26.3) - TECHNOLOGY CODE:
--TE1(26.31) - FIRST TECHNOLOGY CODE: 40.0
--RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 427072
--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY MEDICAL RESEARCH AND
--
-- DEVELOPMENT COMMAND FORT DETRICK MD
--RLC(27.3A) - RESPONSIBLE ORGANIZATION CITY: FORT DETRICK
--RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: MD
--RLZ(27.3C) - RESPONSIBLE ORGANIZATION ZIP CODE: 21702-5012
--RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 2406
--RIN(27.4) - RESP. INDIV: MUSALLAM, H A
--RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: MCMR-PLF
--RIP(27.6) - RESP. ORG. PHONE NUMBER: 301-619-7074
--RIA(27.7) - RESP. INDIV. DSN NUMBER: 343-7074
--SC(28) - PERFORMING ORG. SOURCE CODE: 387300
--POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
--PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE
--SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA
--GC(28.3D) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
--OT(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0
--AU(28.4) - PRIN. INVESTIGATOR: VICKERY, L E
--PIO(28.5) - PRIN. INVEST. OFFICE SYMBOL: 0
--PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-856-6580
--PIA(28.7) - PRIN. INVEST. DSN NUMBER: 0
--P2N(28.8) - ASSOCIATE INVESTIGATORS:
--P2N1(28.8A) - 1ST ASSOC. INVESTIGATOR: BRANDT, M E
--PEP(30) - PRIM PE NBR: 63002A
--PJP(30A) - PRIM PROJ NBR: 30263002D806
--
--TNP(30B) - PRIM TASK NBR: ZZ
--CT(34) - CONTRACT/GRANT TRANSFER NUMBER: DAMD1794J4320
--CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 1 SEP 94
--CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 31 AUG 98
--CFV(34.3) - CONTRACT/GRANT FACE VALUE: \$ 987
--TOT(34.4) - CONTRACT/GRANT CUM TOTAL: \$ 987
--KW(35) - KEYWORDS: BREAST CANCER RESEARCH ; RA VI ; ANTI-
-- ESTROGEN ; RECEPTOR STRUCTURE ; RECEPTOR PURIFICATION ;
-- TAMOXIFEN ; STEROID BINDING ; GENE ACTIVATION ;
--OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
--OBJ(36.1) - OBJECTIVE: (U) OVERPRODUCE THE HUMAN ESTROGEN RECEPTOR IN
-- ESCHERICHIA COLI AND DETERMINE A HIGH RESOLUTION STRUCTURE OF THE
-- PROTEIN. (THE MOLECULAR STRUCTURE OF THE RECEPTOR WILL PROVIDE INSIGHT
-- INTO STEROID-PROTEIN INTERACTIONS INVOLVED IN ESTROGEN BINDING CAPACITY,
-- HOW ESTROGEN BINDING LEADS TO ACTIVATION OF THE RECEPTOR AND EFFECTS ON
-- GENE TRANSCRIPTION AND A BASIS FOR THE RATIONAL DESIGN OF SPECIFIC, HIGH
-- AFFINITY, ANTAGONISTIC DRUG FOR THE TREATMENT OF ESTROGEN-DEPENDENT
-- DISEASES SUCH AS BREAST CANCER.)
--APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
--APP(37.1) - APPROACH: (U) OVERPRODUCE IN E. COLI, RECOMBINANT FRAGMENTS
-- COMPRISING THE HED OF THE HUMAN ESTROGEN RECEPTOR, THE HED RECEPTOR

BINDING. THE ROLES OF SPECIFIC AMINO ACID RESIDUES IN MEDIATING AGONIST AND ANTAGONISTS BINDING AND THEIR INDUCED CONFORMATIONAL CHANGES USING SITE-DIRECTED MUTAGENESIS WILL BE DEFINED. ATTEMPTS WILL BE MADE TO OBTAIN CRYSTALS OF THE LIGAND-FREE AND LIGAND-COMPLEXED FORMS OF THE RECEPTOR OF X-RAY DIFFRACTION ANALYSIS.

--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED

--PRG(38.1) - PROGRESS: (U) THE ESTROGEN RECEPTOR IS A MEMBER OF A SUPERFAMILY OF PROTEINS THAT INCLUDES RECEPTORS FOR STEROID HORMONES, THYROID HORMONES, AND VITAMINS A AND D. LIGAND BINDING TO THESE RECEPTORS IS AN ESSENTIAL INITIAL STEP THAT EVENTUALLY CULMINATES IN INTERACTION WITH TRANSCRIPTION MACHINERY AND MODULATION OF GENE EXPRESSION. THE HUMAN ESTROGEN RECEPTOR HORMONE BINDING DOMAIN (HBD) HAS BEEN SHOWN TO RESIDE IN AMINO ACIDS 301-551. THE PRINCIPAL INVESTIGATOR (PI) DEVELOPED TWO SOLUBLE ESTROGEN RECEPTOR HBD PEPTIDES (RESIDUES 301-551 AND 305-551) WITH THE ESCHERICHIA COLI MALTOSE BINDING PROTEIN AT SUFFICIENT YIELDS (10 MG/LITER OF CULTURE) TO REPRESENT PROTEIN IN AMOUNTS SUFFICIENT FOR A VARIETY OF BIOPHYSICAL STUDIES. INITIAL CHARACTERIZATION STUDIES OBSERVED THAT THE LIGAND BINDING OF THESE PEPTIDES CORRESPONDS ONLY TO 0.5 MOL/ESTRADIOL/MOL HBD RATHER THAN THE EXPECTED 1:1 RATIO. EFFORTS TO EXPLAIN THE REASON FOR THIS DISCREPANCY SUGGEST THAT THE HBD PEPTIDES CONTAIN THE AMINO ACID SEQUENCES BOTH NECESSARY AND SUFFICIENT FOR DIMERIZATION, THAT THEY UNDERGO THE CONFORMATIONAL CHANGES REQUIRED FOR COOPERATIVITY IN A MANNER COMPARABLE

TO THE FULL LENGTH PROTEIN, AND THAT THE EXTREME N-TERMINAL OF THE HBD PLAYS A ROLE IN INTER PROTEIN INTERACTIONS. AVAILABILITY OF ISOLATED PURIFIED HBD WILL PERMIT THE BIOPHYSICAL AND BIOCHEMICAL CHARACTERIZATIONS TO INVESTIGATE THE MECHANISM(S) BY WHICH LIGANDS BIND AND ALTER THE ACTIVITY OF ESTROGEN RECEPTOR PROTEINS.

--PDN(39) - PRODUCTS:

--PDN(39) - PRODUCT SET NUMBER: 1

--PCC(39.1) - PRODUCT TITLE CLASSIFICATION CODE: U

--PIT(39.2) - PRODUCT TITLE: STRUCTURE/FUNCTION OF RECOMBINANT HUMAN ESTROGEN RECEPTOR

--PIN(39.3) - PRODUCT ID/RPT NO: ANNUAL

--PAN(39.4) - PRODUCT AD NUMBER: ADXXXXXXX

--PI(39.5) - PRODUCT INDICATOR: Y

--DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: HI

--PSN(44) - PRIMARY PROJECT SERIAL NUMBER: 806

--FIC(45) - INTERNATIONAL SOURCES CONSIDERED: APPLICABLE

--PD(46) - PROCESSING DATE: 17 NOV 95

--RCD(47) - RECEIPT DATE: 15 NOV 94

--DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED

--DE(48.1) - DESCRIPTORS: (U) ACTIVATION ; AMINO ACIDS ; BIOPHYSICS ; BREAST CANCER ; CANCER ; CAPACITY(QUANTITY) ; DIFFRACTION ANALYSIS ; DIMERS ; DRUGS ; ESCHERICHIA COLI ; ESTROGENS ; FRAGMENTS ; FUNCTIONS ; GENES ; HIGH RESOLUTION ;

HORMONES ; HUMANS ; IN VITRO ANALYSIS ; INTERACTIONS ; LENGTH ; LIGANDS ; MEDICAL RESEARCH ; MODULATION ; MOLECULAR STRUCTURE ; PEPTIDES ; PHARMACOLOGICAL ANTAGONISTS ; PROTEINS ; PURIFICATION ; RESIDUES ; SENSE ORGANS ; SEQUENCES ; SOLUBILITY ; STEROIDS ; THYROID HORMONES ; VITAMINS ; X RAY DIFFRACTION ;

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-- 3 OF 8

--AN(1) - AGENCY ACCESSION NUMBER: DA349204

--ANA(1A) - ACTIVITY CODE: AMCA

--TT(2) - TRANSACTION TYPE: A

--SF(3) - STATUS OF EFFORT: NEW

--SDT(8) - DATE OF SUMMARY: 15 AUG 95
 --EDT(9) - START DATE OF EFFORT: 1 JUL 95
 --ECC(10) - END DATE: 29 FEB 96
 --RCC(12) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED
 --DC(18) - RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED
 --DR(19) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED
 --TI(20) - DISTRIBUTION REASON: PB
 -- TITLE (UNCLASSIFIED): SPRAY DEPOSITION PROCESSING OF AL/SIC MMC
 -- ARMOR MATERIALS AND TA ALLOYS FOR ARMY APPLICATIONS 34374-MS

--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 34374-MS
 --SCH(24) - SEARCH DATA: VOLOSI/950413
 --FG(25) - DOD SUBJECT CATEGORIES:
 -- 1106 METALLURGY AND METALLOGRAPHY
 --RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 040900
 --RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE
 -- RESEARCH TRIANGLE PARK NC
 --RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: MATERIALS SCIENCE DIVISION
 --RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC
 --RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 3704
 --RIN(27.4) - RESP. INDIV: CROWSON, A
 --RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-MS
 --RIP(27.6) - RESP. ORG. PHONE NUMBER: 919-549-0641
 --RIA(27.7) - RESP. INDIV. DSN NUMBER: 832-0641
 --SC(28) - PERFORMING ORG. SOURCE CODE: 387300
 --POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
 --PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE
 --SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA
 --GC(28.3D) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
 --OT(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0
 --AU(28.4) - PRIN. INVESTIGATOR: LAVERNIA, E J
 --PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-824-8714
 --PEP(30) - PRIM PE NBR: 0601102A

--PJP(30A) - PRIM PROJ NBR: 1L161102BH57
 --TNP(30B) - PRIM TASK NBR: 04
 --FFY(30C1) - PRIM FY1: 95
 --FDA(30C2) - PRIM AMOUNT 1: 00070
 --FDW(30C3) - PRIM WORK YRS 1: 01.4
 --CT(34) - CONTRACT/GRANT TRANSFER NUMBER: DAAH049510424
 --CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 1 JUL 95
 --CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 29 FEB 96
 --CFV(34.3) - CONTRACT/GRANT FACE VALUE: \$ 70
 --TOT(34.4) - CONTRACT/GRANT CUM TOTAL: \$ 70
 --KW(35) - KEYWORDS: ATOMIZING ; REFRACTORY METAL ALLOYS ;
 -- ALUMINUM ALLOYS ; ARMOR MATERIALS ; SILICON CARBIDE ;
 --OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
 --OBJ(36.1) - OBJECTIVE: (U) TO DEVELOP A FUNDAMENTAL UNDERSTANDING OF THE
 -- SPRAY ATOMIZATION AND DEPOSITION PROCESS ON THE MICROSTRUCTURAL
 -- CHARACTERISTICS AND TO APPLY THIS TECHNIQUE TO PROCESS GRADIENT ALUMINUM
 -- METAL MATRIX COMPOSITES AND REFRACTORY METAL ALLOYS.
 --APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
 --APP(37.1) - APPROACH: (U) (1) ALUMINUM ALLOY BASED MMCS WILL BE PROCESSED
 -- BY INJECTING CERAMIC PARTICULATES INTO A STREAM OF ATOMIZED LIQUID
 -- ALUMINUM DROPLETS AND COLLECTING THE CO-DEPOSITED MATERIAL ON A WATER-
 -- COOLED SUBSTRATE AS A COHERENT PREFORM. BOTH FUNCTIONALLY GRADIENT AND
 -- LAYERED MMCS WILL BE PREPARED BY CHANGING AND OPTIMIZING SUCH PROCESSING

-- PARAMETERS AS ATOMIZATION PRESSURE, DROPLET FLIGHT DISTANCE, MELT
 -- POURING TEMPERATURE, AND MASS FLOW RATES. REFRACTORY METAL (I.E., TA) AND
 -- REACTIVE METAL (I.E., Ti) ALLOYS WILL BE PROCESSING

MODELS DEVELOPED PREVIOUSLY BY THE PI. (2) TENSILE, FRACTURE, CREEP, AND
BALLISTIC PROPERTIES OF THE SPRAY ATOMIZED ALLOYS AND COMPOSITES WILL BE
DETERMINED AND CORRELATED WITH THE RESPECTIVE SEM, TEM AND X-RAY
MICROSTRUCTURAL EXAMINATIONS.

--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
--PRG(38.1) - PROGRESS: (U) NONE TO REPORT.
--PDN(39) - PRODUCTS:
--PI(39.5) - PRODUCT INDICATOR: Y
--DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: HI
--PSN(44) - PRIMARY PROJECT SERIAL NUMBER: H57
--PD(46) - PROCESSING DATE: 20 SEP 95
--RCD(47) - RECEIPT DATE: 19 SEP 95
--DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
--DE(48.1) - DESCRIPTORS: (U) ALLOYS ; ALUMINUM ; ALUMINUM
-- ALLOYS ; ARMOR ; ATOMIZATION ; BALLISTICS ; CERAMIC MATERIALS ;
-- CREEP ; DEPOSITION ; DROPS ; FLIGHT ; FLOW RATE ; LIQUIDS ;
-- MASS FLOW ; MATHEMATICAL MODELS ; METALS ; MICROSTRUCTURE ;
-- NUMERICAL ANALYSIS ; PARAMETERS ; PARTICULATES ; PRESSURE ;
--
-- PROCESSING ; RANGE(DISTANCE) ; REACTIVITIES ; REFRACTORY METAL
-- ALLOYS ; REFRACTORY METALS ; SILICON CARBIDES ; SPRAYS ;
-- SUBSTRATES ; WATER COOLING ;

-- 4 OF 8

--AN(1) - AGENCY ACCESSION NUMBER: DA322673
--ANA(1A) - ACTIVITY CODE: AMCA
--TT(2) - TRANSACTION TYPE: M
--SE(3) - STATUS OF EFFORT: CHANGED
--PM(4) - PERFORMANCE METHOD: GRANT
--SI(5) - PERFORMANCE TYPE: RDTE
--RD(6) - DATE OF SUMMARY: 8 MAY 95
--PRD(7) - DATE OF PRECEDING SUMMARY: 7 FEB 95
--SDT(8) - START DATE OF EFFORT: 0 MAR 93
--EDT(9) - END DATE: 14 DEC 95
--ECC(10) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--RCC(12) - RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--DC(18) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED
--DR(19) - DISTRIBUTION REASON: PB
--TI(20) - TITLE (UNCLASSIFIED): PHONONS, POLARITONS, ELECTRONIC CARRIERS &
-- LASER DAMAGE 30586-PH
--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 30586-PH
--SCH(24) - SEARCH DATA: N/A

--FG(25) - DOD SUBJECT CATEGORIES:
-- 0903 LASERS AND MASERS
-- 2012 SOLID STATE PHYSICS
-- 0901 ELECTRICAL AND ELECTRONIC EQUIPMENT
--RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 040900
--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE
-- RESEARCH TRIANGLE PARK NC
--RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: PHYSICS DIVISION
--RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC
--RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 3704
--RIN(27.4) - RESP. INDIV: GUENTHER, B D
--RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-PH
--RIP(27.6) - RESP. ORG. PHONE NUMBER: 919-549-0641
--RIA(27.7) - RESP. INDIV. DSN NUMBER: 8320641
--SC(28) - PERFORMING ORG. SOURCE CODE: 387300
--POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
--POC(28.2) - PERF. ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA,
-- IRVINE DEPARTMENT OF
--PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE

NOV-24-1995 11:56

DTIC-BR

--UI(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0
 --AU(28.4) - PRIN. INVESTIGATOR: BRON, W E

--PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-856-4345
 --PEP(30) - PRIM PE NBR: 0601102A
 --PJP(30A) - PRIM PROJ NBR: 1L161102BH57
 --TNP(30B) - PRIM TASK NBR: 07
 --FFY(30D1) - PRIM FY2: 93
 --FDA(30D2) - PRIM AMOUNT 2: 00020
 --FDW(30D3) - PRIM WORK YRS 2: 00.4
 --FFY(30E1) - PRIM FY3: 94
 --FDA(30E2) - PRIM AMOUNT 3: 00020
 --FDW(30E3) - PRIM WORK YRS 3: 00.4
 --FFY(30F1) - PRIM FY4: 95
 --FDA(30F2) - PRIM AMOUNT 4: 00020
 --FDW(30F3) - PRIM WORK YRS 4: 00.4
 --CT(34) - CONTRACT/GRANT TRANSFER NUMBER: DAAH0493G0028
 --CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 14 MAR 95
 --CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 14 DEC 95
 --CFV(34.3) - CONTRACT/GRANT FACE VALUE: \$ 20
 --TOT(34.4) - CONTRACT/GRANT CUM TOTAL: \$ 60
 --KW(35) - KEYWORDS: LASER BEAMS ; LASER DAMAGE ; ELECTRONIC
 -- CARRIERS ; PLLARITONS ; PHONONS ; SEMICONDUCTORS ; DIAMOND ;
 -- AMORPHOUS MATERIALS ; CARBON ;
 --OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
 --OBJ(36.1) - OBJECTIVE: (U) DTIC SEARCH CONTROL NO. VOJ52E. TO DETERMINE

-- THE EFFECT O LASER LIGHT ON THE DYNAMICS OF ELECTRONIC CARRIERS, AND
 -- WHERE POSSIBLE, ON POLARITONS AND PHONONS IN SMALL AND LARGE GAP
 -- SEMICONDUCTORS, NORMAL AND SUPERCONDUCTING METALS, AMORPHOUS DIAMOND,
 -- AND C60 FILMS. RELEVANCE. THE RESEARCH HAS POTENTIAL RELEVANCE TO LASER
 -- TECHNOLOGY RELATED APPLICATIONS FOR THE ARMY.
 --APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
 --APP(37.1) - APPROACH: (U) EXPERIMENTATION TO BE CARRIED OUT AT THE
 -- ULTRASHORT PULSE LASER FACILITY. COHERENT RAMAN EXCIATIONS AND TIME-
 -- RESOLVED COHERENT ANTI-STOCKES RAMAN SCATTERING WILL BE USED, UP TO A
 -- FEW TENS OF FEMTOSECOND RESOLUTION TO TRACK THE DYNAMICAL PROCESSES THAT
 -- LEAD TO LASER DAMAGE AND OTHER DYNAMICAL PHENOMENA.
 --PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
 --PRG(38.1) - PROGRESS: (U) NONE TO REPORT.
 --PDN(39) - PRODUCTS:
 --PI(39.5) - PRODUCT INDICATOR: Y
 --DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: LO
 --PSN(44) - PRIMARY PROJECT SERIAL NUMBER: H57
 --FIC(45) - INTERNATIONAL SOURCES CONSIDERED: APPLICABLE
 --PD(46) - PROCESSING DATE: 8 JUN 95
 --RCD(47) - RECEIPT DATE: 19 MAR 93
 --DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
 --DE(48.1) - DESCRIPTORS: (U) AMORPHOUS MATERIALS ; CARBON ;
 -- CONTROL ; DIAMONDS ; DYNAMICS ; FACILITIES ; LASER BEAMS ;
 -- LASER DAMAGE ; LASERS ; METALS ; PHONONS ; PULSED LASERS ;
 -- RESOLUTION ; SEARCHING ; SEMICONDUCTORS ; SHORT PULSES ;
 -- SUPERCONDUCTORS ;

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--AN(1) - AGENCY ACCESSION NUMBER: DA322612
 --ANA(1A) - ACTIVITY CODE: AMCA
 --TT(2) - TRANSACTION TYPE: M
 --SE(3) - STATUS OF EFFORT: CHANGED
 --PM(4) - PERFORMANCE METHOD: GRANT

NOV-24-1995 11:56

DTIC-BR

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--SDT(8) - DATE OF PRECEDING SUMMARY: 5 DEC 94
--EDT(9) - START DATE OF EFFORT: 0 AUG 92
--ECC(10) - END DATE: 14 AUG 96
--RCC(12) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--DC(18) - RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--OR(19) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED
--TI(20) - DISTRIBUTION REASON: PB
--RANDOM SURFACES & RELATED PHENOMENA 28974-PH
--LCN(23) - TITLE (UNCLASSIFIED): THE ENHANCED BACKSCATTERING OF LIGHT FROM
--SCH(24) - LOCAL CONTROL (WORK UNIT) NUMBER: 28974-PH
--SEARCH DATA: N/A

--FG(25) - DOD SUBJECT CATEGORIES:
--2006 OPTICS
--RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 040900
--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE
--RESEARCH TRIANGLE PARK NC
--RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: PHYSICS DIVISION
--RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC
--RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 3704
--RIN(27.4) - RESP. INDIV: GUENTHER, B D
--RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-PH
--RIP(27.6) - RESP. ORG. PHONE NUMBER: 919-549-0641
--RIA(27.7) - RESP. INDIV. DSN NUMBER: 832-0641
--SC(28) - RESP. ORG. PHONE NUMBER: 919-549-0641
--POA(28.1) - PERFORMING ORG. SOURCE CODE: 387300
--POC(28.2) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
--IRVINE DEPARTMENT OF
--PLC(28.3A) - PERFORMING ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA,
--SCC(28.3B) - PERFORMING ORGANIZATION CITY: IRVINE
--GC(28.3D) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA
--OT(28.3E) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
--AU(28.4) - PERFORMING ORGANIZATION - TYPE CODE: 0
--PI(28.4) - PRIN. INVESTIGATOR: MARADUDIN, A A
--PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-856-5943
--P2N(28.8) - PRIN. INVEST. PHONE NUMBER: 714-856-5943
--ASSOCIATE INVESTIGATORS:

--P2N1(28.8A) - 1ST ASSOC. INVESTIGATOR: WALLIS, R
--PEP(30) - PRIM PE NBR: 0601102A
--PJP(30A) - PRIM PROJ NBR: 1L161102BH57
--TNP(30B) - PRIM TASK NBR: 07
--FFY(30D1) - PRIM FY2: 92
--FDA(30D2) - PRIM AMOUNT 2: 00050
--FDW(30D3) - PRIM WORK YRS 2: 01.0
--FFY(30E1) - PRIM FY3: 93
--FDA(30E2) - PRIM AMOUNT 3: 00100
--FDW(30E3) - PRIM WORK YRS 3: 02.0
--FFY(30F1) - PRIM FY4: 94
--FDA(30F2) - PRIM AMOUNT 4: 00100
--FDW(30F3) - PRIM WORK YRS 4: 02.0
--CT(34) - CONTRACT/GRANT TRANSFER NUMBER: DAAL0392G0239
--CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 14 AUG 95
--CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 14 AUG 96
--CFV(34.3) - CONTRACT/GRANT FACE VALUE: $ 50
--TOT(34.4) - CONTRACT/GRANT CUM TOTAL: $ 300
--KW(35) - KEYWORDS: BACKSCATTERING ; LIGHT SCATTERING ;
--METALS ; DIELECTRICS ; ROUGH SURFACES ;
--OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
--OBJ(36.1) - OBJECTIVE: (U) DTIC SEARCH CONTROL NO. VOJ04B. A COMBINED
--THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE PHENOMENON OF ENHANCED
--BACKSCATTERING OF RADIATION INCLUDING ASSOCIATED

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RELEVANT TO THE ARMY AND TO DOD AT LARGE FOR THE GENERATION OF
SIGNATURES FOR IFF. OTHER APPLICATIONS WILL INCLUDE CAMOUFLAGE AND A
MOST OF COMMERCIAL APPLICATION, FOR EXAMPLE, FOR AIR-TRAFFIC CONTROL.

--APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
--APP(37.1) - APPROACH: (U) ANALYTICAL AND NUMERICAL APPROACHES WILL BE
DEVELOPED TO INVESTIGATE THE PHENOMENON OF ENHANCED BACKSCATTERING OF
RADIATION. THE THEORETICAL WORK WILL USE MONTE CARLO SIMULATIONS AS WELL
AS ANALYTICAL GREEN'S FUNCTIONS AND PERTURBATIVE METHODS. SPECIFIC TWO-
DIMENSIONAL RANDOMLY ROUGH SURFACES WILL BE GENERATED AT SURFACE OPTICS
CORPORATION TO SUPPORT THESE STUDIES. HIGHER THAN THE FIRST MOMENT OF
THE DISTRIBUTION FUNCTION OF SCATTERED RADIATION WILL BE STUDIED BOTH
THEORETICALLY AND EXPERIMENTALLY, VIA THE ASSOCIATED SPECKLE CONTRAST,
INTENSITY CORRELATION FUNCTIONS IN COLLABORATION WITH SURFACE OPTICS
CORPORATION.

--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
--PRG(38.1) - PROGRESS: (U) NONE TO REPORT.
--PDN(39) - PRODUCTS:
--PI(39.5) - PRODUCT INDICATOR: Y
--DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: NO
--PSN(44) - PRIMARY PROJECT SERIAL NUMBER: H57

--FIC(45) - INTERNATIONAL SOURCES CONSIDERED: APPLICABLE
--PD(46) - PROCESSING DATE: 28 JUN 95
--RCD(47) - RECEIPT DATE: 8 JAN 93
--DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
--DE(48.1) - DESCRIPTORS: (U) BACKSCATTERING ; CAMOUFLAGE ;
COMMERCE ; CONTRAST ; CONTROL ; CORRELATION ; DIELECTRICS ;
DISTRIBUTION FUNCTIONS ; FUNCTIONS(MATHEMATICS) ; GREENS
FUNCTIONS ; INTENSITY ; LIGHT ; LIGHT SCATTERING ; METALS ;
MOMENTS ; MONTE CARLO METHOD ; NONLINEAR SYSTEMS ; NUMERICAL
METHODS AND PROCEDURES ; OPTICS ; RADIATION ; SCATTERING ;
SEARCHING ; SIMULATION ; SPECULAR REFLECTION ; STRUCTURES ;
SURFACE ROUGHNESS ; SURFACES ; THEORY ; TWO DIMENSIONAL ;

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--AN(1) - AGENCY ACCESSION NUMBER: DA322607
--ANA(1A) - ACTIVITY CODE: AMCA
--TT(2) - TRANSACTION TYPE: M
--SE(3) - STATUS OF EFFORT: CHANGED
--PM(4) - PERFORMANCE METHOD: GRANT
--SI(5) - PERFORMANCE TYPE: RDTE
--RD(6) - DATE OF SUMMARY: 16 AUG 95
--PRD(7) - DATE OF PRECEDING SUMMARY: 29 JUN 94
--SDT(8) - START DATE OF EFFORT: 0 SEP 92

--EDT(9) - END DATE: 31 AUG 96
--ECC(10) - EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--RCC(12) - RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED
--DC(18) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED
--DR(19) - DISTRIBUTION REASON: PB
--TI(20) - TITLE (UNCLASSIFIED): ENHANCED TCE DEGRADATION USING
GENETICALLY-ENGINEERED MICROORGANISMS 30871-LS-YIP
--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 30871-LS-YIP
--SCH(24) - SEARCH DATA: N/A
--FG(25) - DOD SUBJECT CATEGORIES:
0602 GENETIC ENGINEERING AND MOLECULAR BIOLOGY
0613 MICROBIOLOGY
2403 SOLID WASTES POLLUTION AND CONTROL
--RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 040900
--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE
RESEARCH TRIANGLE PARK NC
--RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: QUENTON, INC.

REC(27.3D) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC
--RIN(27.4) - RESP. INDIV: TOVE, S R 3704
--RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-CB
--RIP(27.6) - RESP. ORG. PHONE NUMBER: 919-549-0641
--RIA(27.7) - RESP. INDIV. DSN NUMBER: 832-0641
--SC(28) - PERFORMING ORG. SOURCE CODE: 387300
--POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
--POC(28.2) - PERF. ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA,
IRVINE DEPARTMENT OF
--PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE
--SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA
--GC(28.3D) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
--OT(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0
--AU(28.4) - PRIN. INVESTIGATOR: WOOD, T K
--PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-725-3147
--PEP(30) - PRIM PE NBR: 0601102A
--PJP(30A) - PRIM PROJ NBR: 1L161102BH57
--TNP(30B) - PRIM TASK NBR: 02
--FFY(30D1) - PRIM FY2: 91
--FFY(30E1) - PRIM FY3: 92
--FDA(30E2) - PRIM AMOUNT 3: 00050
--FDW(30E3) - PRIM WORK YRS 3: 01.0
--FFY(30F1) - PRIM FY4: 93
--FDA(30F2) - PRIM AMOUNT 4: 00050
--FDW(30F3) - PRIM WORK YRS 4: 01.0
--FFY(30G1) - PRIM FY5: 94
--FDA(30G2) - PRIM AMOUNT 5: 00069
--FDW(30G3) - PRIM WORK YRS 5: 01.4
--CT(34) - CONTRACT/GRANT TRANSFER NUMBER: DAAL0392G0398
--CED(34.1) - CONTRACT/GRANT EFFECTIVE DATE: 14 SEP 95
--CEX(34.2) - CONTRACT/GRANT EXPIRATION DATE: 31 AUG 96
--CFV(34.3) - CONTRACT/GRANT FACE VALUE: \$ 69
--TOT(34.4) - CONTRACT/GRANT CUM TOTAL: \$ 169
--KW(35) - KEYWORDS: GENETIC ENGINEERING ; CHEMICAL
DEGRADATION ; MICROORGANISMS ; TRICHLOROETHYLENE ; POLLUTANTS ;
ENZYMES ; WASTE SITES ; CHEMICAL WASTE ;
--OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
--OBJ(36.1) - OBJECTIVE: (U) DTIC SEARCH CONTROL NO. VOP421. TO GENERTICALLY
ENGINEER POWERFUL DEGRADATIVE GENES OF TWO METHANOTROPHS IN ORDER TO
CREATE A NOVEL, RECOMBINANT ORGANISM CAPABLE OF EFFICIENTLY DEGRADING
THE REFERENCE POLLUTANT, TRICHLOROETHYLENE (TCE). RELEVANCE. THIS
RESEARCH SHOULD CONTRIBUTE TOWARD DEVELOPMENT OF A TECHNOLOGY WHICH WILL
ALLOW RAPID, IN SITU RECLAMATION OF ARMY WASTE SITES, AS WELL AS PROVIDE
A MECHANISM FOR DEGRADING CHEMICAL WASTES AS THEY ARE GENERATED AT THE
SOURCE. AS SUCH, IT IS HIGHLY RELEVANT TO ARMY ENVIRONMENTAL CONCERNS IN
GENERAL, AND TO ONGOING WORK AT A NUMBER OF ARMY LABORATORIES AND RDECS.
--APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
--APP(37.1) - APPROACH: (U) USING RECOMBINANT DNA TECHNIQUES, CLONED AND
WELL CHARACTERIZED GENES FOR SOLUBLE METHANE MONOOXYGENASE ENZYMES
(SUMMO) FROM METHYLOSINUS TRICHOSPORIUM 063B AND METHYLOCOCCUS
CAPSULATUS WILL BE EXPRESSED IN A COMMON SOIL BACTERIAL HOST, PSEUDONONAS
PUTIDA, TO CREATE IMPROVED ENZYMATIC PATHWAYS UNDER EXTERNAL CONTROL.
INTERMEDIATES AND PRODUCTS WILL BE VERIFIED BY GC/MS.
--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
--PRG(38.1) - PROGRESS: (U) NONE TO REPORT.
--PDN(39) - PRODUCTS:
--PI(39.5) - PRODUCT INDICATOR: Y
--DTT(40) - DOMESTIC TECHNOLOGY TRANSFER:

- PROCESSING DATE: 20 SEP 95

- RECEIPT DATE: 22 SEP 93

- DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED

- DESCRIPTORS: (U)

ARMY: ARMY RESEARCH LABORATORIES;

BACTERIA; CHEMICAL ATTACK(DEGRADATION); CHEMICALS; CLONES;

CONTROL; DEGRADATION; DEOXYRIBONUCLEIC ACIDS; ENZYMES;

EXTERNAL; GENES; GENETIC ENGINEERING; METHANE;

OXIDOREDUCTASES; POLLUTANTS; SEARCHING; SITES; SOILS;

SOLUBILITY; SOURCES; TRICHLOROETHYLENE; WASTES;

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- AGENCY ACCESSION NUMBER: DA322417

- ACTIVITY CODE: AMCA

- TRANSACTION TYPE: M

- STATUS OF EFFORT: CHANGED

- PERFORMANCE METHOD: GRANT

- PERFORMANCE TYPE: RDTE

- DATE OF SUMMARY: 23 MAY 95

- DATE OF PRECEDING SUMMARY: 5 MAY 95

- START DATE OF EFFORT: 0 APR 92

- END DATE: 21 JUN 95

- EFFORT SECURITY CLASSIFICATION CODE: UNCLASSIFIED

- RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED

- DISTRIBUTION CODE: DISTRIBUTION UNLIMITED

- DISTRIBUTION REASON: PE

- TITLE (UNCLASSIFIED): SOLIDIFICATION PROCESSING & MECHANICAL

- LOCAL CONTROL (WORK UNIT) NUMBER: 29410-MS

- SEARCH DATA: N/A

- DOD SUBJECT CATEGORIES:

1104 LAMINATES AND COMPOSITE MATERIALS

110601 PROPERTIES OF METALS AND ALLOYS

2011 MECHANICS

- RESPONSIBLE ORG. SOURCE CODE: 040900

- RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE

RESEARCH TRIANGLE PARK NC

- RESP. ORG. SPECIFIC COMPONENT: MATERIALS SCIENCE DIVISION

- RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC

- RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 3704

- RESP. INDIV: CROWSON, A

- RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-MS

- RESP. ORG. PHONE NUMBER: 919-549-0641

- RESP. INDIV. DSN NUMBER: 532-0641

- PERFORMING ORG. SOURCE CODE: 387300

- PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE

- PERF. ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA,

IRVINE DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING

- PERFORMING ORGANIZATION CITY: IRVINE

- PERFORMING ORG. LOCATION - STATE/COUNTRY: CA

- PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640

- PERFORMING ORGANIZATION - TYPE CODE: 0

- PRIN. INVESTIGATOR: LAVERNIA, E J

- PRIN. INVEST. PHONE NUMBER: 714-856-8714

- PRIM PE NBR: 0601102A

- PRIM PROJ NBR: 1L161102EHS7

- PRIM TASK NBR: 04

- PRIM FY2: 92

- PRIM AMOUNT 2: 00070

- PRIM WORK YRS 2: 01.4

--FDW(30E3) - PRIM AMOUNT 3: 00111
 --FFY(30F1) - PRIM WORK YRS 3: 02.2
 --FDA(30F2) - PRIM FY4: 94
 --FDW(30F3) - PRIM AMOUNT 4: 00116
 --FFY(30G1) - PRIM WORK YRS 4: 02.3
 --FDA(30G2) - PRIM FY5: 95
 --FDW(30G3) - PRIM AMOUNT 5: 00054
 --CT(34) - PRIM WORK YRS 5: 01.1
 --CED(34.1) - CONTRACT/GRANT TRANSFER NUMBER: DAAL0392G0181
 --CEX(34.2) - CONTRACT/GRANT EFFECTIVE DATE: 21 APR 95
 --CFV(34.3) - CONTRACT/GRANT EXPIRATION DATE: 21 JUN 95
 --TOT(34.4) - CONTRACT/GRANT FACE VALUE: \$ 54
 --KW(35) - CONTRACT/GRANT CUM TOTAL: \$ 351
 -- KEYWORDS: ALLOYS ; REFRACTORY METAL ALLOYS ;
 MICROSTRUCTURE ; COMPOSITE MATERIALS ; TUNGSTEN ALLOYS ;
 TANTALUM ALLOYS ; MECHANICAL PROPERTIES ;
 --OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
 --OBJ(36.1) - OBJECTIVE: (U) DTIC SEARCH CONTROL NO. VOKOOI. TO INVESTIGATE
 THE PROCESSING-MICROSTRUCTURE-PROPERTY RELATIONSHIPS IN REFRACTORY METAL
 ALLOYS PRODUCED BY SOLIDIFICATION PROCESSING TECHNIQUES. RELEVANCE. THE
 RESEARCH HAS THE POTENTIAL FOR PROVIDING A COST EFFECTIVE APPROACH FOR
 PRODUCING IMPROVED HIGH DENSITY MATERIALS FOR ANTI-ARMOR APPLICATIONS.
 --APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
 --APP(37.1) - APPROACH: (U) THE APPROACH WILL INVOLVE THE APPLICATION OF
 TWO SOLIDIFICATION PROCESSING TECHNIQUES: (A) SEMI-SOLID FORMING AND (B)
 SPRAY ATOMIZATION AND CO-DEPOSITION TO PROCESS TANTALUM-TUNGSTEN METAL
 COMPOSITES. PROCESSING PARAMETERS SUCH AS COOLING RATE FOR SEMI-SOLID
 FORMING AND ATOMIZATION PRESSURE AND NOZZLE/SUBSTRATE FLIGHT DISTANCE
 FOR SPRAY DEPOSITION WILL BE VARIED TO OPTIMIZE THE BEST COMBINATION OF
 MICROSTRUCTURE, MECHANICAL PROPERTIES AND DENSITY. THE MICROSTRUCTURE
 WILL BE CHARACTERIZED BY OPTICAL MICROSCOPY, SEM AND TEM AND THE RESULTS
 CORRELATED WITH TENSILE, CREEP AND FRACTURE TOUGHNESS BEHAVIOR.
 --PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
 --PRG(38.1) - PROGRESS: (U) NONE TO REPORT.
 --DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: LO
 --PSN(44) - PRIMARY PROJECT SERIAL NUMBER: H57
 --FIC(45) - INTERNATIONAL SOURCES CONSIDERED: APPLICABLE
 --PD(46) - PROCESSING DATE: 28 JUN 95
 --RCD(47) - RECEIPT DATE: 8 JAN 93
 --DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
 --DE(48.1) - DESCRIPTORS: (U) ALLOYS ; ANTIARMOR AMMUNITION ;
 ATOMIZATION ; COMPOSITE MATERIALS ; CONTROL ; COOLING ; COST
 EFFECTIVENESS ; CREEP ; DEPOSITION ; FLIGHT ;
 FRACTURE(MECHANICS) ; HIGH DENSITY ; MATERIALS ; MECHANICAL
 PROPERTIES ; METHODOLOGY ; MICROSCOPY ; MICROSTRUCTURE ;
 NOZZLES ; OPTICAL ANALYSIS ; PRESSURE ; PROCESSING ;
 RANGE(DISTANCE) ; RATES ; REFRACTORY METAL ALLOYS ; SEARCHING ;
 SOLIDIFICATION ; SPRAYS ; SUBSTRATES ; TANTALUM ALLOYS ;
 TOUGHNESS ; TUNGSTEN ALLOYS ;

 - 8 OF 8
 --AN(1) - AGENCY ACCESSION NUMBER: DA322117
 --ANA(1A) - ACTIVITY CODE: AMCA
 --TT(2) - TRANSACTION TYPE: M
 --SE(3) - STATUS OF EFFORT: COMPLETED
 --PM(4) - PERFORMANCE METHOD: TRANSFER
 --SI(5) - PERFORMANCE TYPE: ROTE
 --RD(6) - DATE OF SUMMARY: 25 APR 94
 --PRD(7) - DATE OF PRECEDING SUMMARY: 14 OCT 93
 --SDT(8) - START DATE OF EFFORT: 0 MAR 91

NOV-24-1995 12:00

DTIC-BR

RECORD SECURITY CLASSIFICATION CODE: UNCLASSIFIED

--DC(18) - DISTRIBUTION CODE: DISTRIBUTION UNLIMITED
 --DR(19) - DISTRIBUTION REASON: PB
 --TI(20) - TITLE (UNCLASSIFIED): A NEW GUIDED WAVE LENS STRUCTURE & ITS
 -- APPLICATIONS 28587-PH
 --LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 28597-PH

--SCH(24) - SEARCH DATA: N/A
 --FG(25) - DOD SUBJECT CATEGORIES:
 -- 2006 OPTICS
 -- 2012 SOLID STATE PHYSICS
 -- 0904 LINE, SURFACE AND BULK ACOUSTIC WAVE DEVICES
 --RSC(27) - RESPONSIBLE ORG. SOURCE CODE: 040900
 --RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME: ARMY RESEARCH OFFICE
 -- RESEARCH TRIANGLE PARK NC
 --RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT: PHYSICS DIVISION
 --RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY: NC
 --RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE: 3704
 --RIN(27.4) - RESP. INDIV: GUENTHER, B D
 --RIO(27.5) - RESP. INDIV. OFFICE SYMBOL & CODE: AMXRO-PH
 --RIP(27.6) - RESP. ORG. PHONE NUMBER: 919-549-0641
 --RIA(27.7) - RESP. INDIV. DSN NUMBER: 832-0641
 --SC(28) - PERFORMING ORG. SOURCE CODE: 367300
 --POA(28.1) - PERFORMING ORG. ACTIVITY NAME: CALIFORNIA UNIV IRVINE
 --POC(28.2) - PERF. ORG. SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA,
 -- IRVINE DEPARTMENT OF COMPUTER AND ELECTRICAL ENGINEERI
 --PLC(28.3A) - PERFORMING ORGANIZATION CITY: IRVINE
 --SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY: CA
 --GC(28.3D) - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
 --OT(28.3E) - PERFORMING ORGANIZATION - TYPE CODE: 0

--AU(28.4) - PRIN. INVESTIGATOR: LEE, C C
 --PIP(28.6) - PRIN. INVEST. PHONE NUMBER: 714-856-7462
 --PEP(30) - PRIM PE NBR: 0601102A
 --PJP(30A) - PRIM PROJ NBR: 1L161102BH57
 --TNP(30B) - PRIM TASK NBR: 07
 --FFY(30D1) - PRIM FY2: 91
 --FDA(30D2) - PRIM AMOUNT 2: 00030
 --FDW(30D3) - PRIM WORK YRS 2: 00.5
 --CT(34) - CONTRACT/GRANT TRANSFER NUMBER: ARO
 --KW(35) - KEYWORDS: OPTICAL LENSES ; GALLIUM ARSENIDES ;
 -- INTEGRATED OPTICS ; WAVEGUIDES ; LENSES ;
 --OCC(36) - OBJECTIVE CLASSIFICATION CODE: UNCLASSIFIED
 --OBJ(36.1) - OBJECTIVE: (U) DTIC SEARCH CONTROL NO. VOK26K. TO DESIGN AND
 -- DEMONSTRATE THE CONSTRUCTION OF AN INTEGRATED OPTICS LENS ON GAAS.
 -- RELEVANCE. THE ARMY IS INTERESTED IN INTEGRATED OPTICS FOR COMMUNICATIONS,
 -- SIGNAL PROCESSING AND BEAM FORMING FOR PUMPING SOLID STATE LASERS. PRIOR
 -- DEMONSTRATIONS OF USEFUL LENSES HAVE BEEN LIMITED TO MATERIALS THAT ARE
 -- NEITHER SOURCES NOR DETECTORS. THE COMBINATION OF THIS LENS WITH GAAS
 -- WILL OVERCOME THIS SHORTCOMING.
 --APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED
 --APP(37.1) - APPROACH: (U) THE FOLLOWING TOPICS WILL BE PURSUED: 1) DESIGN
 -- AND ANALYZE THREE GLASS INTEGRATED OPTICS LENS CONCEPTS PRODUCED ON GAAS
 -- SUBSTRATE. 2) STUDY THE MODE CHARACTERISTICS AND MATCHING PROPERTIES. 3)

-- CONSTRUCT, CHARACTERIZE, AND EVALUATE THE THREE LENS CONCEPTS.
 --PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED
 --PRG(38.1) - PROGRESS: (U) 9103-9306 A LOW-INDEX WAVEGUIDE OF LENS SHAPE
 -- IS EMBEDDED IN A HIGH-INDEX GA.72AL.28/GA.59AL.41AS HOST WAVEGUIDE WITH
 -- ANTI-REFLECTION LAYER INCORPORATED AT THE LENS BOUNDARIES TO REDUCE
 -- REFLECTIONS. AN IMPROVEMENT FACTOR OF 10

NOV-24-1995 12:00

DTIC-BR

... THE CONE SPOT SIZE OF 2.1 UM AND A
 SIDELobe LEVEL OF -13 DB WERE MEASURED. THE ANGULAR FIELD OF VIEW
 MEASURED IN THE HOST WAVEGUIDE IS 11 DEGREES. A QUADRI-LEVEL
 PHOTOMASKING TECHNIQUE WAS DEVELOPED FOR THE FABRICATION OF THE NEW LENS
 STRUCTURE. THIS TECHNIQUE CAN BE APPLIED TO VARIOUS INTEGRATED OPTICS
 STRUCTURES WHERE REFLECTION REDUCITON IS REQUIRED BETWEEN LOW-INDEX AND
 HIGH-INDEX WAVEGUIDE REGIONS.

--PDN(39) - PRODUCTS:
 --PDN(39) - PRODUCT SET NUMBER: 1
 --PCC(39.1) - PRODUCT TITLE CLASSIFICATION CODE: U
 --FIT(39.2) - PRODUCT TITLE: A NEW GUIDED WAVE LENS STRUCTURE AND ITS
 -- APPLICATIONS
 --PIN(39.3) - PRODUCT ID/RPT NO: ARO 26527.1-PH
 --PAN(39.4) - PRODUCT AD NUMBER: A275541
 --PI(39.5) - PRODUCT INDICATOR: Y
 --DTT(40) - DOMESTIC TECHNOLOGY TRANSFER: HI

--PSN(44) - PRIMARY PROJECT SERIAL NUMBER: H57
 --FIC(45) - INTERNATIONAL SOURCES CONSIDERED: APPLICABLE
 --PD(46) - PROCESSING DATE: 27 JUN 94
 --RCD(47) - RECEIPT DATE: 28 DEC 92
 --DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED
 --DE(48.1) - DESCRIPTORS: (U) ANGLES ; BEAM FORMING ;
 BOUNDARIES ; CONTROL ; EFFICIENCY ; GALLIUM ARSENIDES ;
 INDEXES(RATIOS) ; INTEGRATED SYSTEMS ; LASER PUMPING ; LENSES ;
 MATCHING ; MATERIALS ; OPTICAL LENSES ; OPTICS ; SEARCHING ;
 SHAPE ; SIDELOBES ; SIGNAL PROCESSING ; SIZES(DIMENSIONS) ;
 SOLID STATE LASERS ; STRUCTURES ; SUBSTRATES ; THROUGHPUT ;
 WAVEGUIDES ;

--*****

-- (<ENTER NEXT COMMAND>)

UNCLASSIFIED
SCN: CKQ59L-960329-213844 MAR 29, 1996
DTIC FORMAT B0102

WORK UNIT INFORMATION SYSTEM (WUIS)

1. ACCESSION NO: DN275115 1A. ACTIVITY CODE: NONR
2. TRANSACTION TYPE: M 3. STATUS OF EFFORT: D
4. PERFORMANCE METHOD: G 5. PERFORMANCE TYPE: R
6. DATE OF SUMMARY: 15 FEB 1995 7. DATE OF PRECEDING SUMMARY: 13 APR 1994
8. START DATE: MAR 1990 9. END DATE: MAR 1997
10. EFFORT SECURITY CLASS CODE: (U) 11. EFFORT SECURITY ADDL NOTICE:
12. RECORD SECURITY CLASS CODE: (U) 13. RECORD SECURITY ADDL NOTICE:
14. CLASSIFICATION AUTHORITY:
15. REGRADING CODE: 16. REGRADING DATE:
17. REGRADING EVENT:
18. DISTRIBUTION CODE: D 19. DISTRIBUTION REASON: AD
20. TITLE: CHANNELING RADIATION X-RAY LASER
21. SUBORDINATE RECORD IND: 22. LINKING ACCESSION NO:
23. LOCAL CTRL NO: 312G001---16 24. SEARCH CTRL NO:
25. DOD SUBJECT CATEGORIES:
A: 2009 PLASMA PHYSICS AND MAGNETOHYDRODYNAMICS
B:
C:
26. TAXONOMY CODES
MISSION AREAS FUNCTIONS TECHNOLOGIES
A: A: A:
B: B: B:
C: C: C:
27. RESPONSIBLE ORGANIZATION SOURCE CODE: 265250
ACTIVITY NAME: OFFICE OF NAVAL RESEARCH ARLINGTON VA
SPECIFIC COMPONENT: OFFICE OF NAVAL RESEARCH DEPARTMENT OF THE NAVY
CITY: ARLINGTON
STATE/COUNTRY CODE: VA ZIP CODE: 222170000 GEOPOL CODE: 5110
RESPONSIBLE INDIVIDUAL: ROBERSON, C W
OFFICE/CODE: COMM PHONE: 703 696-4222 0000 DSN:
28. PERFORMING ORGANIZATION SOURCE CODE: 387300
ACTIVITY NAME: CALIFORNIA UNIV IRVINE
SPECIFIC COMPONENT: UNIVERSITY OF CALIFORNIA, IRVINE
CITY: IRVINE

SCN: CKQ59L-960329-213844

ACCESSION NBR: DN275115 PAGE 000001
UNCLASSIFIED

UNCLASSIFIED
SCN: CKQ59L-960329-213844 MAR 29, 1996
DTIC FORMAT B0102

STATE/COUNTRY CODE: CA ZIP CODE: GEOPOL CODE: 0640
PRINCIPAL INVESTIGATOR: ROSTOKER, N
OFFICE/CODE: COMM PHONE: 714 824-6949 DSN:
ASSOCIATE INVESTIGATOR: GARATE, E

30. PRIMARY FUNDING DATA

PROGRAM ELEMENT NO	PROJECT NO	TASK NO
0601153N	RR01109	RR0110901
FISCAL YEAR	DOLLAR AMOUNT (THOUSANDS)	WORK YEARS
	0	
	0	
95	85	01.0
94	131	01.6
93	75	00.9

31. 1ST CONTRIBUTING FUNDING DATA

PROGRAM ELEMENT NO	PROJECT NO	TASK NO
FISCAL YEAR	DOLLAR AMOUNT (THOUSANDS)	WORK YEARS
	0	
	0	
	0	
	0	
	0	

32/33. 2ND CONTRIBUTING FUNDING DATA/ROLLUP INDICATOR

PROGRAM ELEMENT NO	PROJECT NO	TASK NO	
FISCAL YEAR	DOLLAR AMOUNT (THOUSANDS)	WORK YEARS	ROLLUP IND
	0		
	0		
	0		
	0		
	0		

34. CONTRACT/GRANT/TRANSFER NO: N0001490J1675

EFFECTIVE DATE: 01 MAR 1995 EXPIRATION DATE: 31 MAR 1997
FACE VALUE: 85 CUMULATIVE TO DATE TOTAL: 867

35. KEYWORDS: CHANNELING RADIATION, HIGH CURRENT, STELLATRON, X-RAYS

36. OBJECTIVE: (U) THE TECHNICAL OBJECTIVE IS TO INVESTIGATE CHANNELING RADIATION X-RAY LASERS FOR THE DEVELOPMENT OF SUB MICRON ELECTRONICS AND NEW MATERIALS.

37. APPROACH: (U) THE APPROACH WILL BE TO DEVELOP HIGH CURRENT DENSITY TIP CATHODES SUITABLE FOR DRIVING CHANNELING RADIATION LASERS.

SCN: CKQ59L-960329-213844

ACCESSION NBR: DN275115 PAGE 000001A
UNCLASSIFIED

UNCLASSIFIED
SCN: CKQ59L-960329-213844 MAR 29, 1996
DTIC FORMAT B0102

38. PROGRESS: (U) PRELIMINARY EXPERIMENTS HAVE GENERATED PULSED CURRENTS UP TO 80 MA AND 5 NS DURATION FROM A TUNGSTEN TIP OF 1.5 MICRON RADIUS WHEN THE TIP WAS IRRADIATED BY A NITROGEN LASER. THE TIP WAS BIASED TO 22 KV AND THE ENERGY DENSITY OF LIGHT AT THE TIP WAS 25MJ/CM(2) RESULTING IN A QUANTUM EFFICIENCY OF 0.65.

39. PRODUCTS

39.5 PRODUCT INDICATOR: N	40. DOMESTIC TECHNOLOGY TRANSFER: HI
41. STUDIES AND ANALYSIS CATEGORIES: O	42. SPECIAL STUDIES SUBJECTS:
44. PRIMARY PROJECT SERIAL NO:	45. INTERNATL SOURCES CONSIDERED:
46. PROCESSING DATE: 18 MAY 1995	47. RECEIPT DATE:
48. DESCRIPTORS: (U) CURRENTS, DENSITY, ENERGY, HIGH POWER, LIGHT, NITROGEN LASERS, PULSES, RADIATION, X RAY LASERS	

ATTN: Jeff Schmitt

Fax: (301) 209-0842

From: Kenneth Foster
DTIC-BR1/3
FINAL REPORT

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--      1      OF      1
--AN(1)  - AGENCY ACCESSION NUMBER:      DF041700
--TT(2)  - TRANSACTION TYPE: M
--SE(3)  - STATUS OF EFFORT:      COMPLETED
--PM(4)  - PERFORMANCE METHOD:      CONTRACT
--SI(5)  - PERFORMANCE TYPE:      RDTE
--RD(6)  - DATE OF SUMMARY:      29 AUG 85
--PRD(7) - DATE OF PRECEDING SUMMARY: 29 AUG 85
--SDT(8) - START DATE OF EFFORT: 0 JAN 78
--EDT(9) - END DATE:      0 JUN 83
--ECC(10) - EFFORT SECURITY CLASSIFICATION CODE:      UNCLASSIFIED
--RCC(12) - RECORD SECURITY CLASSIFICATION CODE:      UNCLASSIFIED
--DC(18)  - DISTRIBUTION CODE:      US GOV & ITS CONTRACTORS ONLY
--TI(20)  - TITLE (UNCLASSIFIED): THE INTERACTION OF ELECTROMAGNETIC
--      RADIATION WITH SOLID MATERIALS
--LCN(23) - LOCAL CONTROL (WORK UNIT) NUMBER: 0
--FG(25)  - DOD SUBJECT CATEGORIES:
--      2012      SOLID STATE PHYSICS
--      2010      QUANTUM THEORY AND RELATIVITY
--RSC(27)  - RESPONSIBLE ORG. SOURCE CODE:      012550
--RAN(27.1) - RESPONSIBLE ORG. ACTIVITY NAME:      AIR FORCE OFFICE OF
--      SCIENTIFIC RESEARCH BOLLING AFB DC
--RCN(27.2) - RESP. ORG. SPECIFIC COMPONENT:      AF OFFICE OF SCIENTIFIC
--
--      RESEARCH DIR OF ELECT/SOLID STATE SCIENCES
--RLC(27.3A) - RESPONSIBLE ORGANIZATION CITY:      BOLLING AFB
--RLS(27.3B) - RESPONSIBLE ORGANIZATION STATE/COUNTRY:      DC
--RLZ(27.3C) - RESPONSIBLE ORGANIZATION ZIP CODE:      20332
--RLG(27.3D) - RESPONSIBLE ORGANIZATION GEOPOLITICAL CODE:      1101
--RIN(27.4)  - RESP. INDIV:      SWERDLOW MAX
--RIP(27.6)  - RESP. ORG. PHONE NUMBER:      202-767-4984
--SC(28)     - PERFORMING ORG. SOURCE CODE:      387300
--POA(28.1)  - PERFORMING ORG. ACTIVITY NAME:      CALIFORNIA UNIV IRVINE
--POC(28.2)  - PERF. ORG. SPECIFIC COMPONENT:      CALIFORNIA UNIVERSITY OF
--PLC(28.3A) - PERFORMING ORGANIZATION CITY:      IRVINE
--SCC(28.3B) - PERFORMING ORG. LOCATION - STATE/COUNTRY:      CA
--GC(28.3D)  - PERFORMING ORG. LOCATION - GEOPOLITICAL CODE: 0640
--OT(28.3E)  - PERFORMING ORGANIZATION - TYPE CODE:      0
--AU(28.4)  - PRIN. INVESTIGATOR:      MARADUDIN A A
--PEP(30)    - PRIM PE NBR:      0601102F
--PJP(30A)   - PRIM PROJ NBR:      2306
--TNP(30B)   - PRIM TASK NBR:      C2
--CT(34)     - CONTRACT/GRANT TRANSFER NUMBER:      F4962078C0019
--CED(34.1)  - CONTRACT/GRANT EFFECTIVE DATE:      1 JAN 78
--CEX(34.2)  - CONTRACT/GRANT EXPIRATION DATE:      31 DEC 82
--TOT(34.4)  - CONTRACT/GRANT CUM TOTAL:      $ 578
--OCC(36)    - OBJECTIVE CLASSIFICATION CODE:      UNCLASSIFIED
--
--OBJ(36.1)  - OBJECTIVE: (U) AF FUNCTION - AEROSPACE COMMUNICATIONS
--      SURVEILLANCE AND DETECTION SYSTEMS REQUIRE ELECTRO-OPTICAL DEVICES WHICH
--      EXPLOIT THE SPECIAL PROPERTIES AND INTERACTIONS OF INFRARED RADIATION
--      WITH SOLID STATE MATERIALS. OPPORTUNITY - MATERIALS SENSITIVE IN THE
--      INFRARED REGION OF ELECTROMAGNETIC SPECTRUM ARE IMPORTANT COMPONENTS OF
--      AIRBORNE AND SPACEBORNE SYSTEMS. OBJECTIVE - THIS IS A

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--- ELECTROMAGNETIC SPECTRUM - AND TO STUDY BULK AND SURFACE OPTICAL
--- PROPERTIES AS WELL AS NONLINEAR OPTICAL PHENOMENA IN SOLIDS. HOW WORK
--- CONTRIBUTES - THE INFRARED OPTICAL PROPERTIES OF THESE MATERIALS ARE
--- IMPORTANT TO THE DEVELOPMENT OF INFRARED DETECTORS AND COHERENT SOURCES,
--- INTEGRATED OPTICS AND ELECTRO-OPTICAL TECHNIQUES, AND HIGH ENERGY
--- INFRARED LASER WINDOWS AND MIRRORS AS WELL AS INTERACTIONS OF MATERIALS
--- SUBJECTED TO LASER BEAMS.

--APC(37) - APPROACH CLASSIFICATION CODE: UNCLASSIFIED

--APP(37.1) - APPROACH: (U) STUDIES OF THE NONLINEAR INTERACTIONS OF
--- SURFACE ELECTROMAGNETIC WAVES AND OF SURFACE ACOUSTIC WAVE WILL BE BASED
--- ON THE USE OF GREEN'S FUNCTIONS THAT GIVE THE ELECTRIC FIELDS, AND
--- ACOUSTIC WAVE FIELDS, CREATED BY POINT SOURCES IN LINEAR DIELECTRIC-
--- VACUUM AND ELASTIC SYSTEMS. THE NONLINEAR TERMS IN MAXWELL'S EQUATIONS,
--- AND IN THE EQUATIONS OF MOTION AND BOUNDARY CONDITIONS OF AN ELASTIC
--- MEDIUM, WILL PLAY THE ROLE OF SOURCE TERMS THAT, TOGETHER WITH THE GREEN'S

--- S FUNCTIONS, PRODUCE THE NONLINEAR FIELDS. THE PRINCIPAL THEORETICAL
--- METHOD TO BE USED IN DERIVING A THEORY OF THE EFFECTS ON ELECTROMAGNETIC
--- FIELDS OF LARGE AMPLITUDE PERIODIC STRUCTURES ON SOLID SURFACES IS GREEN'S
--- S THEOREM. THIS THEOREM ENABLES THE ELECTROMAGNETIC FIELDS IN THE
--- VICINITY OF DIELECTRIC-VACUUM INTERFACES TO BE EXPRESSED IN TERMS OF
--- THEIR VALUES, AND THE VALUES OF THEIR NORMAL DERIVATIVES, ON THE
--- INTERFACE. THE LATTER FUNCTIONS SATISFY INTEGRAL EQUATIONS THAT CAN BE
--- SOLVED BY EXPANSIONS IN FOURIER SERIES. MANY-BODY PERTURBATION THEORY
--- PROVIDES THE BASIC APPROACH TO THE STUDY OF THE INFLUENCE OF FREE
--- CARRIERS ON LATTICE ABSORPTION IN SMALL GAP SEMICONDUCTORS. THE
--- PSEUDOPOTENTIAL APPROACH TO THE DETERMINATION OF ELECTRIC BAND
--- STRUCTURES, TOGETHER WITH LATTICEDYNAMICAL THEORIES OF THE MEAN SQUARE
--- VIBRATIONAL DISPLACEMENTS OF ATOMS IN CRYSTALS, PROVIDES THE MEANS FOR
--- STUDYING THE TEMPERATURE DEPENDENT ABSORPTANCE OF METALS IN THE NEAR
--- INFRARED.

--PGC(38) - PROGRESS CLASS CODE: UNCLASSIFIED

--PRG(38.1) - PROGRESS: (U) 780101 - 821231 THIS IS A FINAL REPORT ON
--- RESULTS OBTAINED DURING A THEORETICAL STUDY ON THE INTERACTION OF
--- ELECTROMAGNETIC WAVES WITH SOLIDS. DURING THE TENURE OF THE PROGRAM, A
--- VARIETY OF INTERACTIONS WHICH INFLUENCE THE (LINEAR) RESPONSE OF SOLIDS
--- TO EXTERNAL ELECTROMAGNETIC RADIATION, WITH EMPHASIS ON THE FREQUENCY
--- REGIME WHICH EXTENDS FROM THE VISIBLE, THROUGH THE INFRARED AND DOWN TO
--- THE MICROWAVE WERE EXPLORED. EXAMPLES ARE THE STUDY OF INTRINSIC FREE

--- CARRIER SCATTERING MECHANISMS IN DOPED, POLAR MATERIALS, WHERE THEORY
--- PROVIDES AN EXCELLENT ACCOUNT OF DATA WITH NO ADJUSTABLE PARAMETERS.
--- ALSO, THE SCATTERING OF ELECTRONS FROM PHONONS AND OTHER ELECTRONS IN
--- THE NEAR PROXIMITY OF THE SURFACE, AND THEIR INFLUENCE ON THE MICROWAVE
--- RESPONSE OF METALS HAS BEEN EXPLORED. THE LAST FEW YEARS OF THE PROGRAM
--- SAW INCREASING EMPHASIS ON THE PROPAGATION OF WAVES ALONG INTERFACES
--- WITH NONPLANAR PROFILE (ROUGH SURFACES, PERIODIC GRATING STRUCTURES),
--- AND ON THE NONLINEAR INTERACTION BETWEEN WAVES IN THE NEAR VICINITY OF
--- PLANAR, AND NONPLANAR INTERFACES. PERTURBATION THEORY METHODS WERE
--- DEVELOPED, WHICH TREAT THE DEVIATIONS FROM A PERFECTLY FLAT PROFILE AS
--- SMALL, AND ALSO NONPERTURBATIVE METHODS WERE APPLIED TO PERIODIC
--- STRUCTURES POSSIBLY OF LARGE AMPLITUDE.

--SAC(41) - STUDIES AND ANALYSIS CATEGORIES: 0

--PD(46) - PROCESSING DATE: 11 OCT 85

--RCD(47) - RECEIPT DATE: 11 OCT 85

--DEC(48) - DESCRIPTORS CLASS. CODE OVERALL: UNCLASSIFIED

--DE(48.1) - DESCRIPTORS: (U) ABSORPTION ; ACOUSTIC FIELDS ;
--- ACOUSTIC WAVES ; AMPLITUDE ; ATOMS ; BOUNDARIES ; COHERENCE ;
--- COMMUNICATION AND RADIO SYSTEMS ; CRYSTALS ; DETECTORS ;
--- DISPLACEMENT ; ELASTIC PROPERTIES ; ELECTRIC FIELDS ;
--- ELECTROMAGNETIC FIELDS ; ELECTROMAGNETIC RADIATION ;
--- ELECTROMAGNETIC SPECTRA ; ELECTRONS ; ELECTROOPTICS ; EQUATIONS

-- GRATINGS(SPECTRA) ; GREENS FUNCTIONS ; INFRARED DETECTORS ;
-- INFRARED OPTICAL SYSTEMS ; INFRARED RADIATION ; INTEGRAL
-- EQUATIONS ; INTEGRATED SYSTEMS ; INTERACTIONS ; INTERFACES ;
-- LASER BEAMS ; MATERIALS ; MAXWELLS EQUATIONS ; MEAN ; METALS ;
-- MICROWAVES ; MIRRORS ; N BODY PROBLEM ; NEAR INFRARED RADIATION
-- ; NONLINEAR SYSTEMS ; NONPLANAR ; OPTICAL PHENOMENA ; OPTICS ;
-- PARAMETERS ; PERTURBATION THEORY ; PHONONS ; POLAR REGIONS ;
-- PROFILES ; REGIONS ;

--END

<< ENTER NEXT COMMAND >>

END --

Reconstruction (based on earlier versions of the same file) of probable three lines of text cut off by fax machine in fax from DTIC of 8 April 1996 of accession number DF041700:

INFRARED REGION OF ELECTROMAGNETIC SPECTRUM ARE IMPORTANT COMPONENTS OF AIRBORNE AND SPACEBORNE SYSTEMS. OBJECTIVE - THIS IS A THEORETICAL RESEARCH EFFORT TO INVESTIGATE THE INTERACTION OF ELECTROMAGNETIC RADIATION WITH SOLID MATERIALS, TO INVESTIGATE FUNDAMENTAL PROCESSES AND ELEMENTARY EXCITATIONS THAT OCCUR MAINLY IN THE INFRARED REGION OF THE ELECTROMAGNETIC SPECTRUM - AND TO STUDY BULK AND SURFACE OPTICAL PROPERTIES AS WELL AS NONLINEAR OPTICAL PHENOMENA IN SOLIDS. HOW WORK

26 OCT, 78
LANGUAGE
FITS,

BUT THE BLOCKING OF TEXT INTO GROUPS OF
23 LINES IMPLIES THAT ONLY 2 LINES
ARE MISSING.